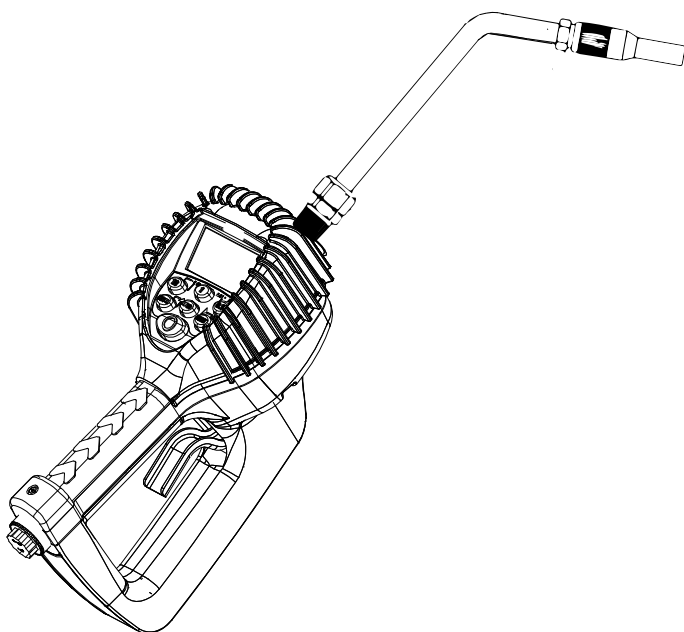


Electronic lube meter

Model 905, series "C"



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Section	F22
Page	23H

⚠ DANGER

Read manual prior to installation or use of this product. Keep manual nearby for future reference. Failure to follow instructions and safety precautions may result in death or serious injury.

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Safety

Read and carefully observe these instructions before installing, operating or troubleshooting this equipment.

The equipment must be installed, maintained and repaired exclusively by persons familiar with the instructions.

Install and/or operate the equipment only after safety instructions and this guide have been read and are completely understood.

Adequate personal protection must be used to prevent splashing of material on the skin or in the eyes.

Always disconnect power source (electricity, air or hydraulic) from the equipment when it is not being used.

Any other use not in accordance with instructions will result in loss of claim for warranty or liability.

- Do not misuse, over-pressurize, modify parts, use incompatible chemicals, fluids, or use worn and/or damaged parts.
- Always read and follow the fluid manufacturer's recommendations regarding fluid compatibility, and the use of protective clothing and equipment.
- Failure to comply may result in death or serious injury.

Explanation of signal words for safety



This is the safety alert symbol. It is used to alert you to potential physical injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

SAFETY INSTRUCTION

Safety instruction signs indicate specific safety-related instructions or procedures.

DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a hazardous situation which, if not avoided will result in death or serious injury.

CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

WARNING

Systems which will be dispensing fluids under pressure may need to be protected by using a thermal relief kit which will safely limit the pressures caused by thermal expansion. Please contact your local Lincoln distributor and refer to Section K5, Page 31 for more details. Failure to include thermal relief protection may cause damage not covered under Lincoln's warranty policy.

WARNING

Explosion and fire hazards

Improper grounding, poor ventilation, open flames or sparks can cause a hazardous condition and result in an explosion or fire and cause serious injury.

- Be sure the fluid system is properly grounded. See your pump instruction manual for details.
- If there is static sparking or if you feel an electric shock while using the meter, stop dispensing immediately. Identify and correct the problem before continuing.
- Provide fresh air ventilation. This will avoid the buildup of fumes from the fluid being dispensed.
- Do not dispense flammable fluids.
- Keep the dispensing area free of debris including solvents, rags and spilled gasoline.

WARNING

Meter hazards

Equipment misuse can cause the meter to rupture or malfunction and cause serious injury.

- This equipment is for professional use only.
- Read all instructions, tags, and labels before operating the equipment.
- Use the equipment only for its intended purpose.
- **Do not** modify or alter the equipment.
- **Do not** leave equipment unattended while dispensing.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- **Do not** exceed the maximum working pressure level of the lowest rated system component.
- Use only extensions and nozzles that are designed for use with this equipment.
- Use only fluids and solvents that are compatible with the equipment. Read all fluid and solvent manufacturer's warnings.
- Tighten all fluid connections before operating this equipment.
- **Do not** stop or deflect leaks with hands, body gloves or rags.
- **Do not** dispense towards any person or any part of the body.
- **Do not** place hands or fingers over the end of or into the dispense valve.
- Comply with all local, state and federal fire, electrical and safety regulations.
- Use of this product in a manner other than specified in this manual may result in impaired operation or damage to equipment.

WARNING

This meter is not designed to dispense petroleum products or methanol based windshield wiper fluid. This meter is designed for windshield wiper fluid, brake fluid, or water-based solutions.

Notice

The automatic nozzle requires 60 psi (4,1 bar) to open and function properly. A pump exceeding 60 psi (4,1 bar) is required for adequate flow and proper operation. A pump ratio of at least 3:1 is recommended.

General

The electronic preset meter (EPM) is designed specifically to meter and dispense bulk fluids for servicing automobiles, trucks, buses, construction equipment, and similar applications. The meter is lightweight, rugged and has a comfortable grip. The meter is designed specifically to dispense motor oils (S.A.E.5-50), gear oils (S.A.E. 80-240), automatic transmission fluid, and hydraulic fluid.

A superior rugged, shock-resistant design for demanding environments.

Meter is not for resale measurement of fluid.

Operation

This unit can be programmed to dispense in quarts, liters, pints, and gallons. You can program any batch size in a matter of seconds. A 5-digit liquid crystal display, accurate to the second decimal point, shows the exact amount of fluid dispensed.

The EPM meter uses 4 replaceable AA batteries and is calibrated at the factory. The meter can also be recalibrated easily in the field.

Electronic accuracy will help you save time and money. The preset feature will allow users to perform other service tasks while fluid is dispensed.

Typical applications

- Fleet maintenance shops
- Industrial assembly
- Quick lube facilities
- Dealerships
- Construction and mining equipment
- General automotive service centres
- Specialty service and repair shops

Features and specifications

- Oval gear driven meter
- Durable, rugged design
- Rubber boot
- Large, easy-to-read LCD display
- Ease of operation
- CE approved
- Totalization in liters and gallons
- Delivery in liters, quarts, pints, gallons
- Automatic non-drip nozzle with manual shut-off feature
- Maximum totalizer number: 99,999 gallons or liters
- Maximum dispense volume: 99,999 units
- Maximum preset volume: 99.9 Units
- Calibration factor for different fluids
- Changeable units of measure
- One programmable preset
- Total and re-settable total
- Minimum 20,000 cycles on battery life
- Low battery indicator
- Low battery safety lock out feature
- Uses standard AA batteries
- In-line swivel standard with all meters
- Automatic shut-off at preset amount
- Emergency manual shut-off
- Precision control valve operation

⚠ WARNING

Systems that dispense fluids under pressure may need to be protected by using a thermal relief kit. Kit safely limits the pressures caused by thermal expansion.

Please contact your local Lincoln distributor and refer to **section K5, page 31** for more details.

Failure to include thermal relief protection may cause damage not covered under Lincoln's warranty policy.

⚠ WARNING

Explosion and fire hazards

Improper grounding, poor ventilation, open flames or sparks can cause a hazardous condition and result in an explosion or fire and cause serious injury.

- Be sure the fluid system is properly grounded. See your pump instruction manual for details.
- If there is static sparking or if you feel and electric shock while using the meter, stop dispensing immediately. Identify and correct the problem before continuing.
- Provide fresh air ventilation. This will avoid the buildup of fumes from the fluid being dispensed.
- Do not smoke while dispensing flammable fluids.
- Keep the dispensing area free of debris including solvents, rags and spilled gasoline.

⚠ WARNING

This meter is designed specifically to dispense petroleum products. Do not use for windshield wiper fluid, brake fluid, or water-based solutions.

Meter buttons



Used to enter the dispense batch quantity when in the EPM mode.

Total is used to display the accumulated total of fluid dispensed, as well as the re-settable total

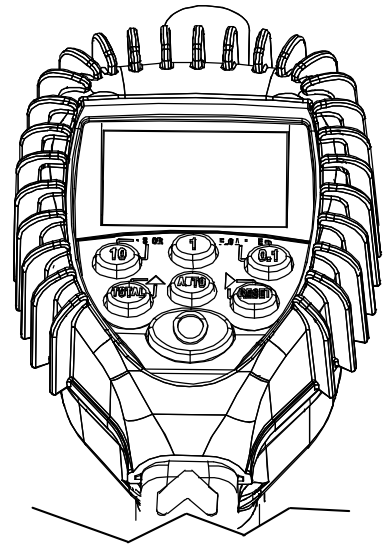
Auto is used to enter and exit the manual or batch mode.

Reset is

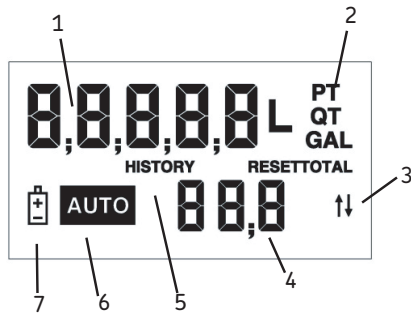
- used in EPM mode to clear the previous batch.
- used to reset the re-settable total dispensed while pressing the TOTAL button.

Shut-off or stop is used to stop the flow through an emergency override.

Meter display



LCD display



- 1 Displays re-settable total, accumulated total and scale factor.
- 2 Displays unit of measure.
- 3 Arrows - **not used on this version.**
- 4 Preset batch quantity.
- 5 History icon - **not used on this version.**
- 6 AUTO indicates EPM mode.
- 7 Low battery icon.

Meter installation

Relieve system pressure

- 1 Turn off the power supply to the pump or close the shutoff valve.
- 2 Dispense any fluid in the system into a waste container by opening the meter(s).
- 3 Open all bleed-type master air valves and fluid meter(s) in the system.
- 4 Leave the meter(s) open until ready to pressurize the system.

WARNING

Pressurized equipment

Do not clean, service or inspect any part of meter while pressurized.

Equipment stays pressurized until pressure is manually relieved. To reduce risk of injury from fluid spray, follow pressure relief procedures when:

- instructed to relieve pressure
- stop dispensing
- check, clean or service any system equipment
- clean or install nozzles.

Grounding

- 1 Grounding reduces the risk of static sparking. Ground all system components according to local, state, and federal codes. Consult the pump user's manual and other system components to ground the following:
 - 2 Pump: follow manufacturer's recommendations.
 - 3 Air and fluid hoses: use only grounded hoses.
 - 4 Air compressor: follow manufacturers recommendations.
 - 5 Fluid supply container: follow the local code.

WARNING

Explosion and Fire

Do not operate this meter without correct grounding.

Movement of fluids through the dispensing system creates static electricity. Static electricity can ignite volatile fumes resulting in an explosion and fire.

Failure to comply may result in serious injury or death.

Flushing procedure

Notice

If the system has multiple dispense positions, begin at the position farthest from the pump and move toward the pump.

Notice

If installation is new or if fluid in lines is contaminated, flush system before installing meter(s).

- 1 Close fluid dispense valves at every position.
- 2 Once the main fluid outlet valve at the pump is closed, the air pressure to the pump motor is properly adjusted and the air valve is opened.
- 3 Slowly open the main fluid valve.
- 4 Place the hose end in a waste container. Make sure hose is secure so no fluid leaks during flushing.
- 5 Slowly open the dispense valve and allow enough oil to pass through it to ensure that the system is clean.
- 6 Close the valve and repeat for all dispense positions.

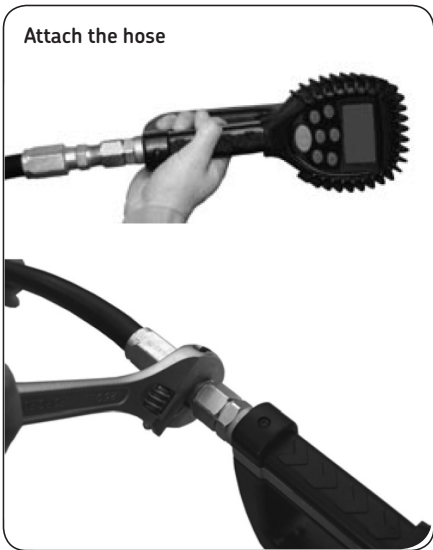
Apply meter to hose

Close the drain valve before starting this procedure.

- 1 Attach swivel to meter. Apply thread sealant to the external end of the hose. Recommended sealant is Loctite 243.



- 2 Insert the metal end of the hose into the swivel. Tighten completely with an open ended, adjustable, wrench.



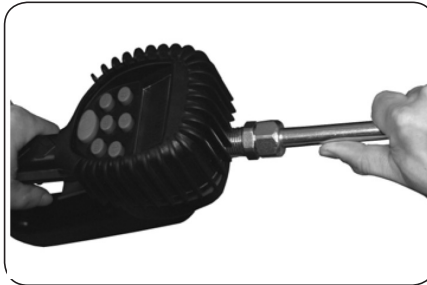
! Notice

Threaded end of meter always has internal threads. Metal end of hose must have external threads.

Inlet and outlet swivel connections are either 1/2 in. NPT (1/2 in. BSPP), depending on meter model.

Apply nozzle to meter

- 1 On the opposite end, apply sealant to the end of the nozzle. Recommended sealant is Loctite 243.



- 2 Thread the nozzle onto the meter. Screw it in tightly with an open ended, adjustable, wrench.



- 3 Open all dispense position shut-off valves.
- 4 Start the pump to pressurize the system.
- 5 Before use, to ensure accuracy, purge all air from the fluid lines and dispense valve(s).

Meter operation

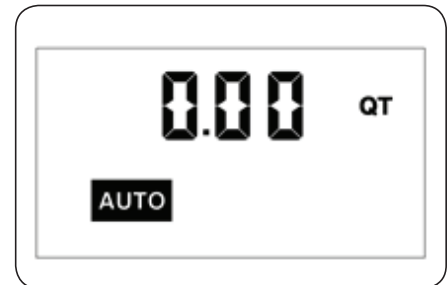
Manual mode

In the manual mode the meter operates as a free flow dispensing handle.



Notice

Keypad **auto** button is used to toggle between manual mode and batch mode.

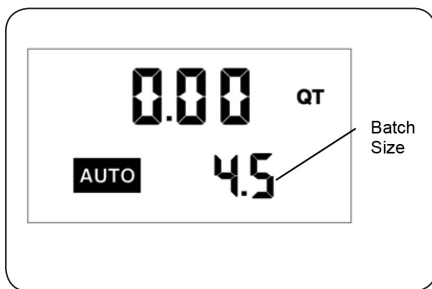


- 1 Pull the trigger to begin the flow.
- 2 The display shows the amount dispensed.
- 3 When the desired amount has been dispensed, release the trigger
- 4 Press **reset** button once to reset the counter display to zero.

Auto batch mode

To enter the batch mode from the manual mode press the meter **auto** button. When in the **auto batch mode** the **auto** icon displays and the batch quantity shows in the lower, right hand side of the LCD display.

- 1 Change the batch size by pressing the 10, 1 or 0.1 buttons.
 - 1.1 Press the 10 button to increase the batch amount by increments of 10.
 - 1.2 Press the 1 button to increase the batch amount by increments of 1 unit.
 - 1.3 Press the 0.1 button to increase the batch amount by increments of 0.1 unit.



- 2 Pull the trigger to begin the flow.
- 3 Release the trigger, allowing it to fall back.



Notice

The meter always locks in the maximum open position.

- 4 The flow automatically shuts off after the batch quantity has dispensed.
- 5 After the batch quantity has been dispensed the meter is a free flow-dispensing handle until the reset button is depressed. To top off the fluid, pull the trigger to begin the flow and release it when the desired amount has been pumped.



Notice

In case of an emergency or to interrupt a batch, the meter is equipped with an emergency override (→ **Emergency override, page 10**).

- 6 Press the **reset** button when finished. The display resets and the meter is now ready for the next batch to be dispensed.

Operating mode functions

These functions operate the same in manual mode and auto batch mode.

Re-settable/accumulated totals

The meter has two flow totalizers. One is re-settable total. The other is accumulated total.

- 1 To see the accumulated total and the re-settable total:
 - 1.1 Press and hold the **total** button to see the accumulated total.
 - 1.2 Continue holding the **total** button.
 - 1.3 After three (3) seconds the display changes to the re-settable total.
- 2 Resettotal displays the total fluid dispensed since the resettable total was last set back to zero.
- 3 . Press the button while viewing resettotal to set it back to zero.
- 4 . Release the button to return to the operating display.

Resetttable total



Notice

Accumulated total cannot be reset unless user changes from English units to metric units or from metric to English units (→ **Change factory settings, Change unit of measure, page 15**).

Emergency override

In case of an emergency or to interrupt a batch, the meter is equipped with an emergency override.

- 1 Press the red **stop** button to activate the emergency override. The override closes the valve, immediately stopping fluid flow.
- 2 Batching can continue after an emergency override by pulling up on the trigger.

Error code

SFO (scale factor 0) The scale factor setting for the meter is 0.000.

- You must set a non-zero value to properly measure fluid being dispensed.
- To input a valid scale factor for the meter follow the instructions in the “change factory settings” section of this manual.

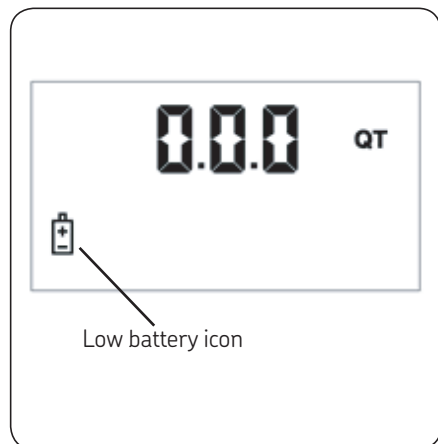
All other error codes are for factory purposes only.

To clear the meter, reset press .

Service

Low battery

When the batteries need to be changed a progression of warnings appears on the meter screen.



First Warning: the low battery icon appears in the lower left corner of the display.

Change the batteries.

Second warning: battery icon flashes.

The battery power is too low and meter functions are disabled.

Changing the Batteries

The battery compartment is located in the lower case on the underside of the trigger guard.

- 1 Turn the unit over.
- 2 Unscrew the two screws. Remove the battery door to expose the batteries.
- 3 Replace the old batteries.



Notice

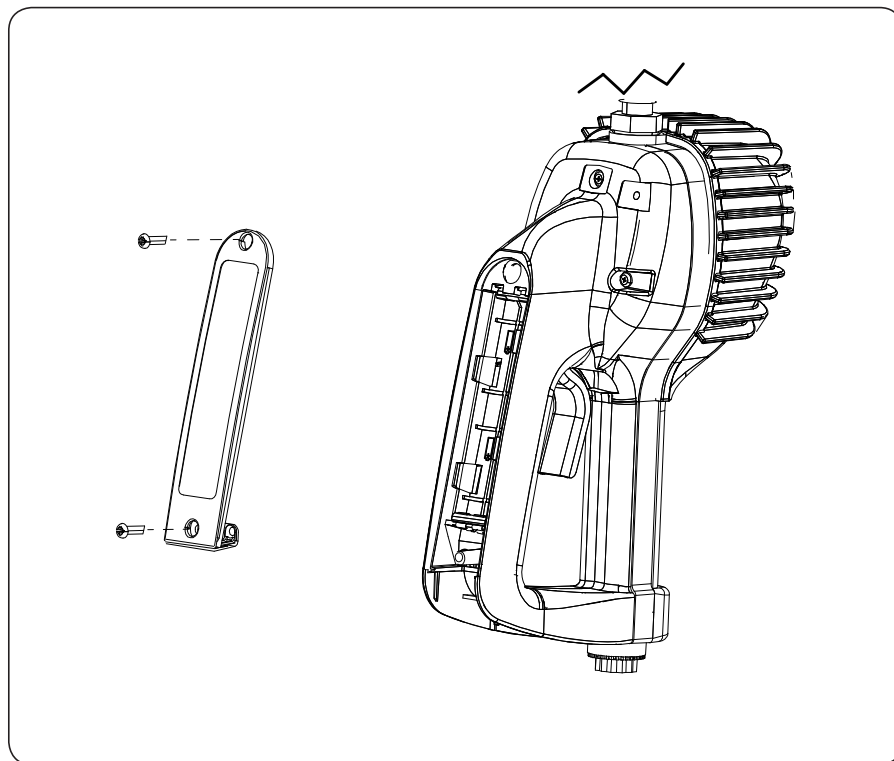
Battery polarity markings are inside battery compartment.
Meter takes 4 AA, alkaline, batteries.

- 4 Dispose of used batteries properly, according to local regulations.



Notice

Changing batteries does not affect any programmed values or totals.



Change factory settings

Each meter is calibrated at the factory for use with motor oil (→ **Change scale factor**, page 11). The unit of measure is also selected prior to shipment.

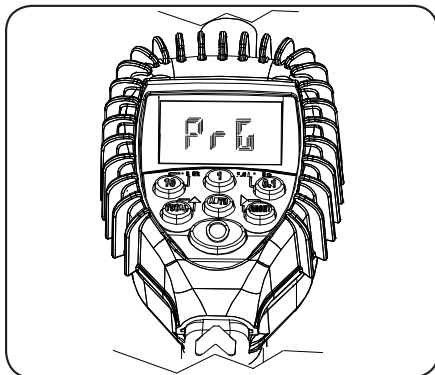
Verify firmware version

- 1 The firmware version and code checksum can be displayed by holding the **total** and **1** button at the same time.
- 2 The last two digits on the lower right are the firmware version.
- 3 Meters with version 18 or higher use the procedure outlined in this manual for changing the unit of measure, scale factor and enabling or disabling the EPM functionality.

Programming

To change the factory settings:

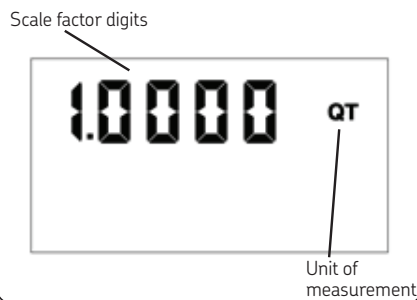
- 1 Push and hold at the same time the **total** and **auto** buttons.
- 2 PrG will appear on the display.
- 3 Release the **total** and **auto** buttons.
- 4 Then press and release in order the 1, **auto**, 10, 0.1 and the **total** buttons.
- 5 The current unit of measure will now be flashing indicating that you have entered the programming mode.



Change unit of measure

- ! Notice** Actual unit of measure is flashing when programming mode is entered.
Meter has option of four different units of measure from factory.

Programming display



- 1 Press the **total** button to toggle between the four options; pt, qt, gal, l.
- 2 When the desired unit of measure is displayed, press the **reset** button.
- 3 If L, (Liters), is selected, the decimal point begins to flash.
 - 3.1 You now have the option to change the decimal point to either a period or a comma.
 - 3.2 To do this, press the button.
- 4 If no scale factor changes are necessary, refer to **Save changes**.

- ! Notice** Changing unit of measurement from metric to English or from English to metric clears re-settable total and accumulated total.

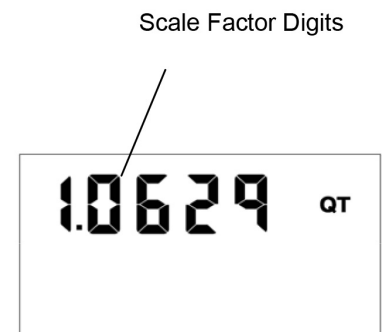
Change scale factor

- ! Notice** Changing scale factor changes accuracy of meter, potentially causing it to overflow or under fill. Potential for a mechanical breakdown may exist.

- 1 To view the current scale factor:
- 2 Press the **reset** button to advance through the scale factor digits.

- ! Notice** All digits can be scrolled between 0 and 9 except first. It can only be scrolled from 0 to 1 or from 1 to 0.

Scale factor display



- 3 Press the **total** button to change the selected number.
- 4 Press the **reset** button to advance to the next number in scale factor.
- 5 Repeat steps 2 and 3 for all five digits in scale factor.

Save changes

- 1 Push and hold at the same time the **total** and **auto** buttons.
- 2 The display will flash 3 times and go blank.
- 3 Press the **reset** button and the display will turn back on.

Verify changes

- 1 Verify unit of measure is correct.
- 2 Push and hold the **total** button and **auto** button together, to verify that the scale factor is correct.

Calculate scale factor

A scale factor is a number used to adjust meter accuracy. The scale factor is set at the factory using motor oil with a viscosity of 10W.

The primary use for scale factor recalibration is to batch fluids with different viscosities. If the fluid has a lower viscosity, more fluid can slip past the meter gears without being detected. Changing the scale factor adjusts the meter to compensate for the loss.

To view the current scale factor

Press and hold the **total** button and the **auto** button at the same time.

For an approximate scale factor for different viscosities, refer to diagram.



Notice

Original scale factor of meter was written on trigger when calibrated at factory and may have been revised after field installation. Use scale factor showing on display, not on trigger.

Changing scale factor will change accuracy of meter, potentially causing it to overfill or under fill, causing a potential mechanical breakdown.

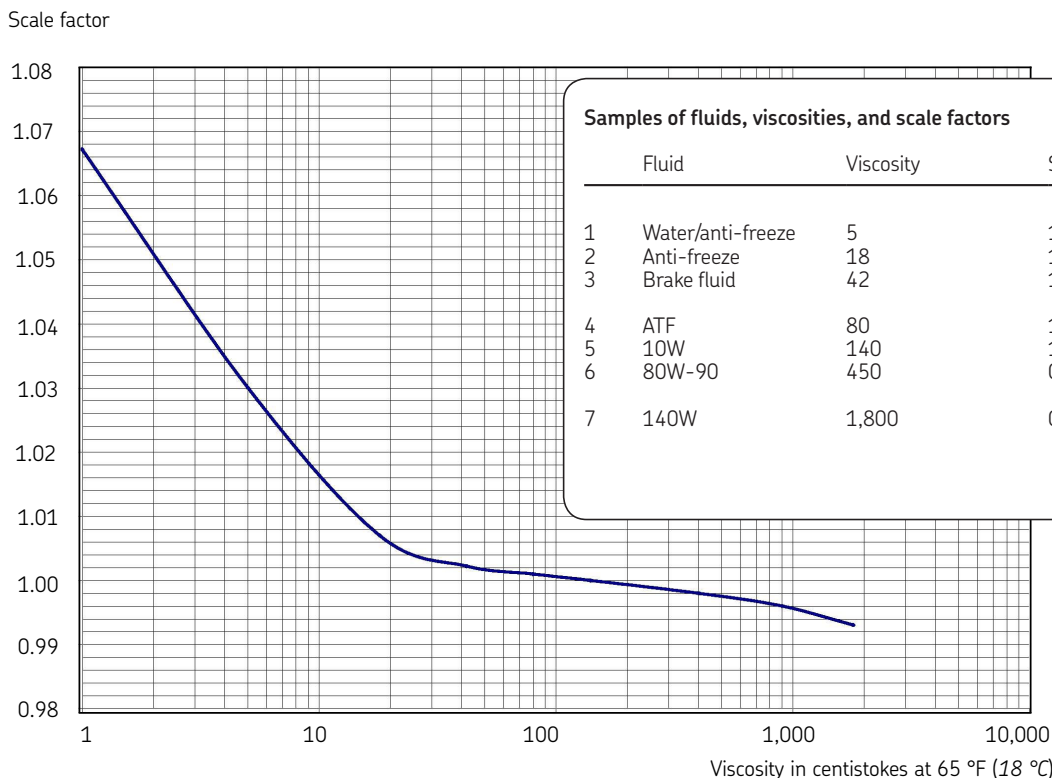
Absolute scale factor test

For absolute scale factor, perform this test:

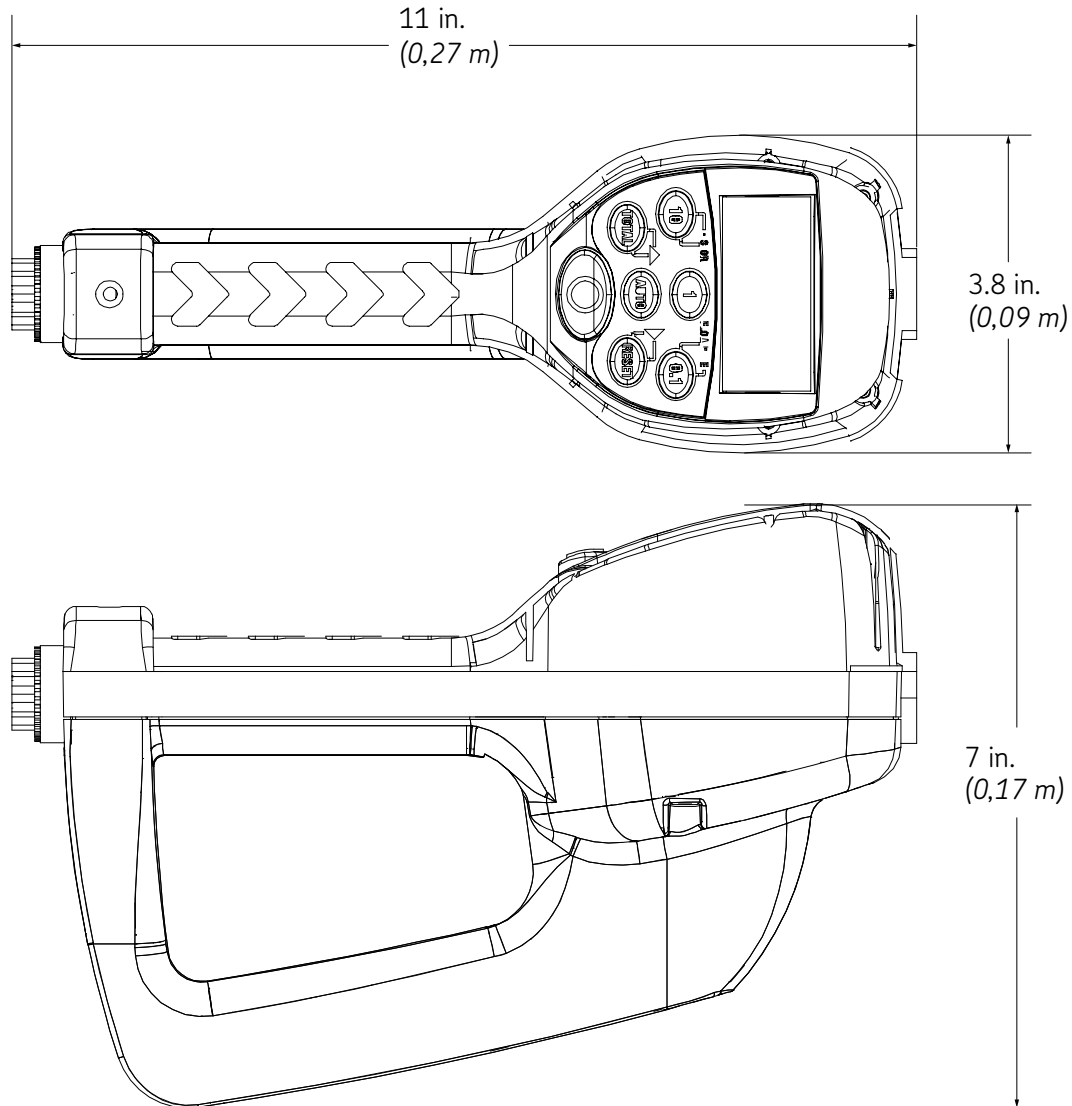
- 1 Run a measured amount of fluid through the meter.
- 2 If the meter delivers 4.20 qt. (3,9 l) and the display shows only 4.00 qt. (3,7 l) then the scale factor needs to be adjusted.
- 3 Divide what the meter delivered 4.20 qt. (3,9 l) by what the display shows 4.00 qt. (3,7 l). You get an error factor of 1.05.
- 4 The existing scale factor is 1.0123, as shown in steps 1 and 2 in **To view the current scale factor, this page.**
- 5 To calculate a new factor: 1.0123 (existing Scale Factor) x 1.05 (error factor) = 1.0629 (new scale factor). Enter that number as described in the change scale factor section of this manual.
- 6 Enter that number as described in change scale factor.

Diagram 1

Chart of approximate scale factors for fluids of different viscosity



Dimensions



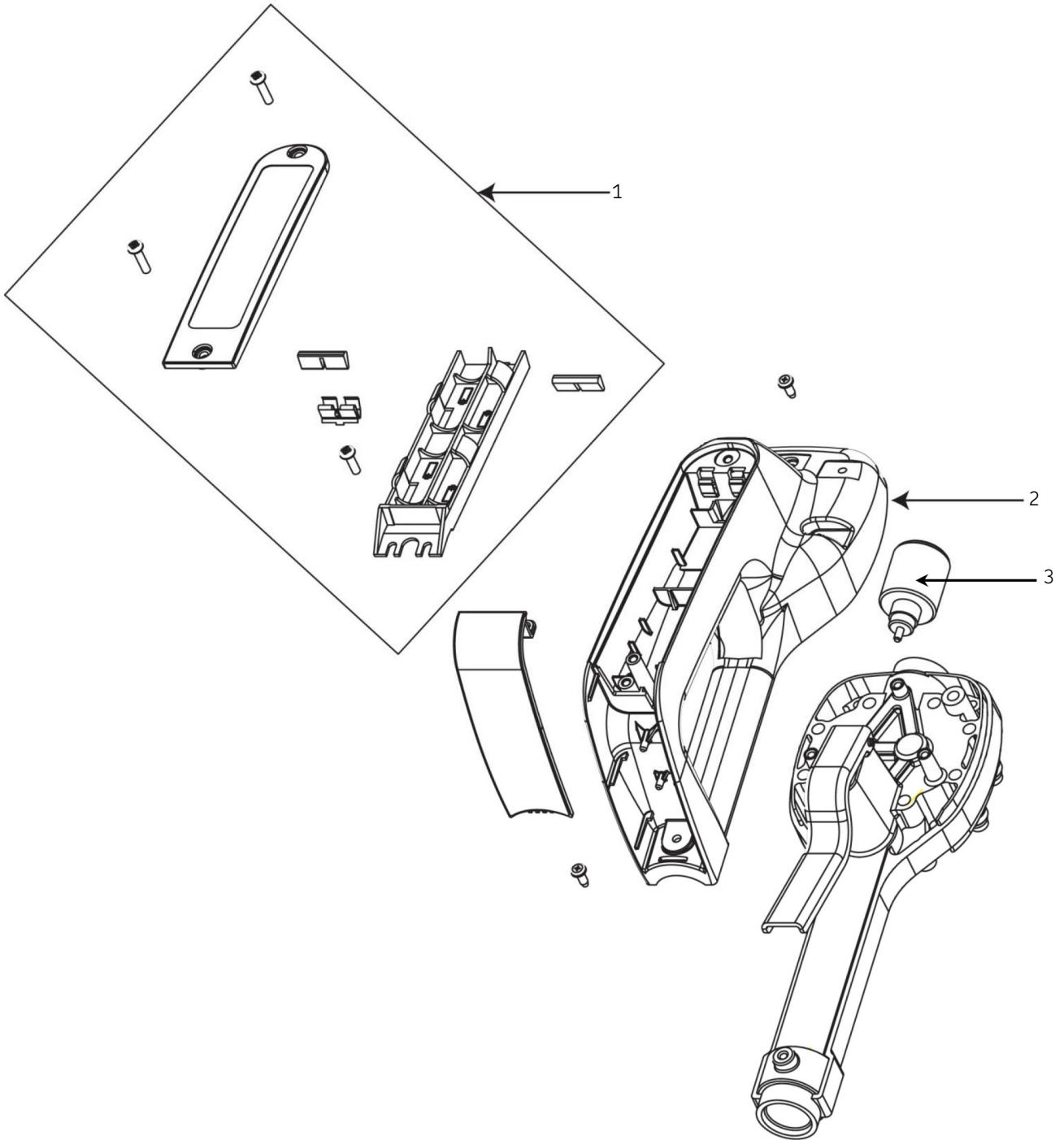
Specifications

Maximum flow	10 gal./min. (38 l/min.)
Minimum flow	0.25 gal./min. (1 l/min.)
Operating pressure (maximum)	1,000 psi (69 bar)
Operating pressure (minimum)	5 psi (0,35 bar)
Operating temperature (maximum)	120 °F (50 °C)
Operating temperature (minimum)	20 °F (-5 °C)
Accuracy – oils	± 0.5%
5 digit LCD display,	Quarts, pints, gallons, liters
Compatible fluids	motor oil, gear oil, automatic transmission and hydraulic fluid
Inlet and outlet connections	1/2 in. NPT
Minimum and maximum flow range	Varies with fluid viscosity

⚠ DANGER

Do not use unit with flammable liquids.

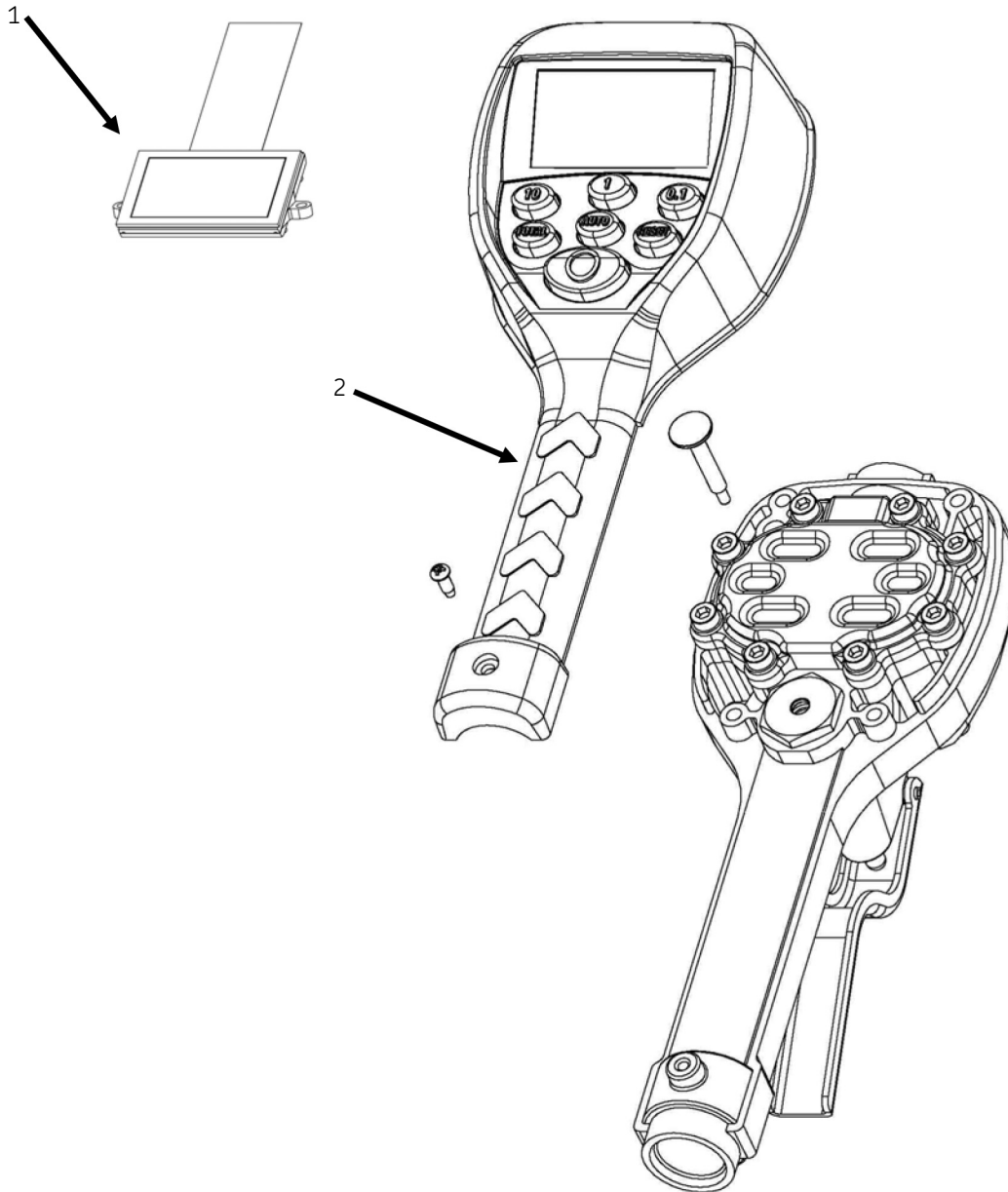
Service parts



Service parts

Item no.	Description	Part number
1	Battery holder assembly	274607
2	Bottom case with screws	272384
3	Solenoid	276319

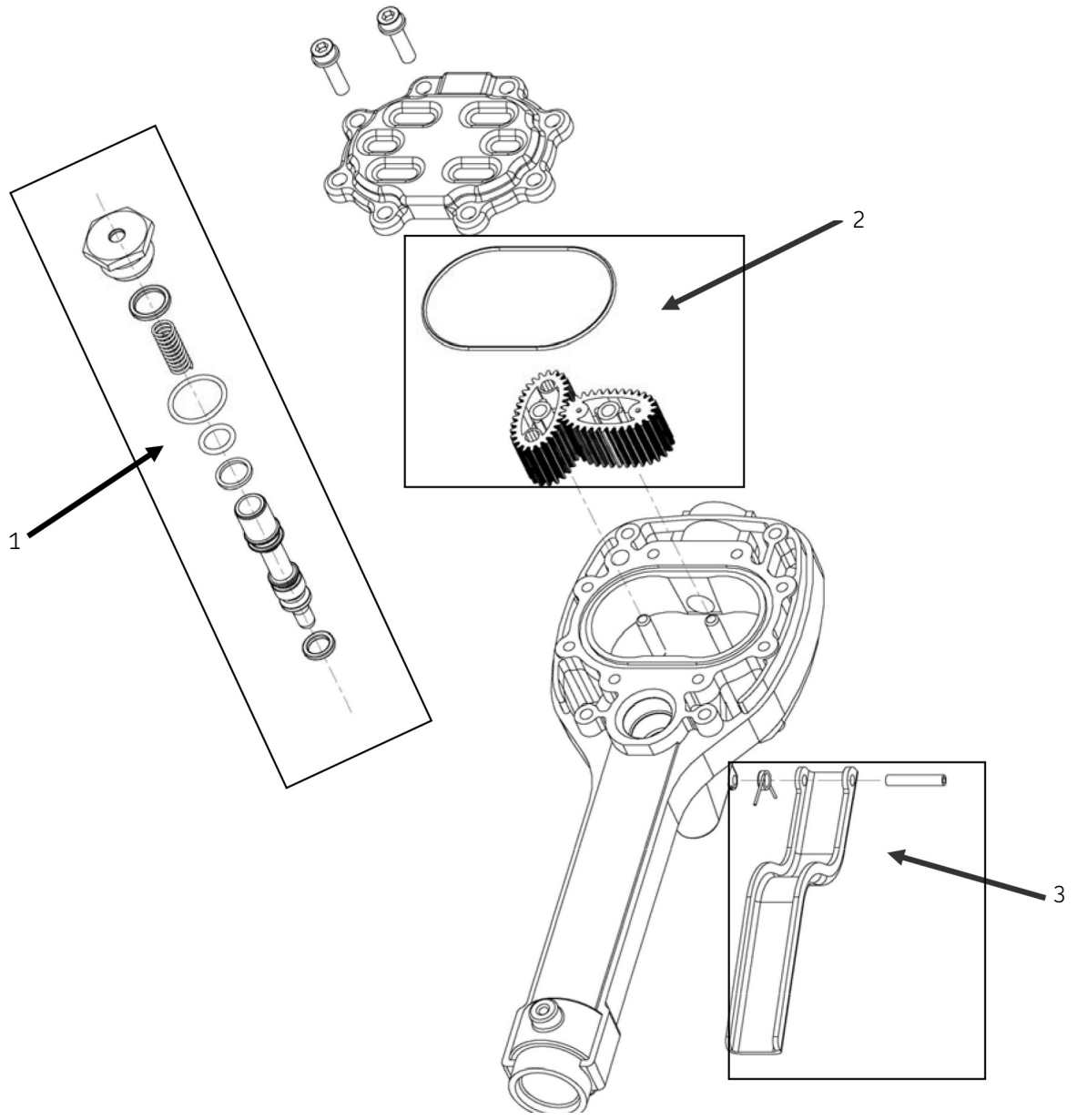
Service parts, continued



Service parts

Item no.	Description	Part number
1	Display assembly	274610
2	EPM2 standard register assembly	274631
Not shown	Swivel, NPT	272397
Not shown	Rubber boot	274609

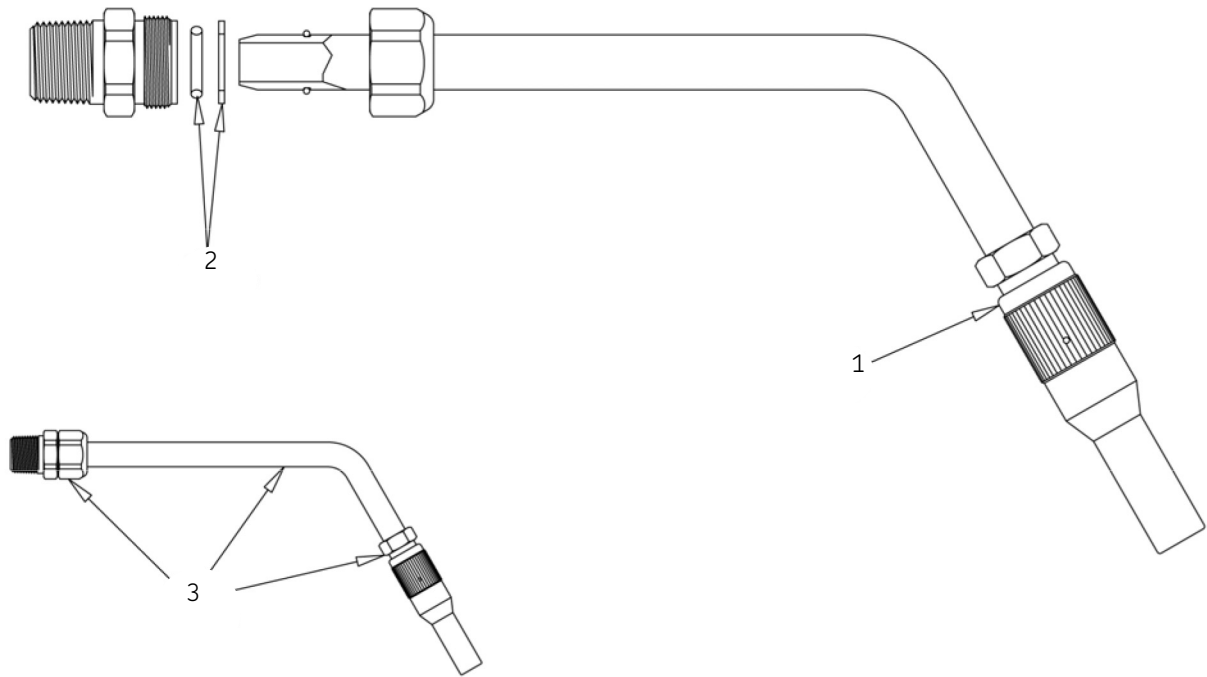
Service parts



Service parts

Item no.	Description	Part number
1	Valve assembly	272373
2	Gear service kit with o-ring	272377
3	Trigger assembly	272378

Service parts



Service parts

Item no.	Description	Part number
1	Non-drip nozzle assembly	84799
2	O-ring and washer kit	272390
3	Nozzle assembly ¹⁾	272391

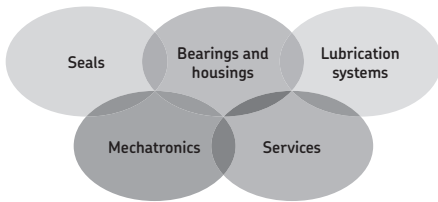
¹⁾ Consists of items 1 and 2

Troubleshooting

Symptom	Possible cause	Remedy
Battery icon is displayed	Batteries are low	Replace batteries
Display blank	Meter asleep.	Push reset button.
	Loose battery connection.	Remove battery pack and check battery connection and push reset button
	Batteries dead.	Replace batteries and push reset button
Meter does not latch for batching	Program error	Remove and reinsert battery pack. Push reset button.
	Meter not in auto mode.	Press auto button and program batch size
	Meter not reset after prior batch.	Press reset button
Slow or no fluid flow	Low batteries.	Check for battery icon, replace batteries and push reset button.
	Filter is clogged.	Clean or replace the filter in the swivel nut.
	Pump pressure is low.	Turn up the pump pressure.
Meter inaccurate	Foreign material is jamming meter.	Contact your local distributor for repair.
	Scale factor not correct for fluid	Enter program mode, check and reset program factor

WARNING

Relieve the pressure prior to checking or repairing the meter. Make sure all valves, controls and pumps are operating correctly. Failure to comply may result in serious injury or death.



The Power of Knowledge Engineering

Combining products, people, and application-specific knowledge, SKF delivers innovative solutions to equipment manufacturers and production facilities in every major industry worldwide. Having expertise in multiple competence areas supports SKF Life Cycle Management, a proven approach to improving equipment reliability, optimizing operational and energy efficiency and reducing total cost of ownership.

These competence areas include bearings and units, seals, lubrication systems, mechatronics, and a wide range of services, from 3-D computer modelling to cloud-based condition monitoring and asset management services.

SKF's global footprint provides SKF customers with uniform quality standards and worldwide product availability. Our local presence provides direct access to the experience, knowledge and ingenuity of SKF people.

